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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,965	09/24/2003	Kei Matsuoka	243115US2RD	1483
22850 7590 01/31/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER RUTHKOSKY, MARK	
			ART UNIT	PAPER NUMBER
			1745	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/31/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/668,965

Applicant(s)

MATSUOKA ET AL.

Examiner

Mark Ruthkosky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 2-5 and 10-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1,6-9 and 26-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/22/06; 5/24/05; 12/24/03; 9/24/2003
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Election/Restrictions

Applicant's election of Group I, claims 1, 6-9, and 26-28, in the reply filed on 11/13/2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Drawings

The drawings filed on 9/24/2003 have been approved.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

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international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Pastula et al. (US 2002/0004154.)

The instant claims are to a fuel cell system comprising a fuel cell having one or more anodes, one or more cathodes and electrolytes respectively put there between, comprising: a fuel supply unit supplying fuel to the anodes; an air supply unit supplying air to the cathodes; and a heat exchanger having a drain connected to the fuel supply unit, the heat exchanger exchanging heat between the air supplied to the cathode and exhaust gas exhausted from the anode so as to condense water from the exhaust gas and discharge the water to the drain.

Pastula et al. (US 2002/0004154) teaches a fuel cell system comprising a fuel cell having one or more anodes, one or more cathodes and electrolytes respectively there between. The fuel cell comprises a fuel supply unit supplying fuel to the anodes; an air supply unit supplying air to the cathodes; and a heat exchanger having a drain connected to the fuel supply unit. The heat exchanger exchanges heat between the air supplied to the cathode and the exhaust gas exhausted from the anode so as to condense water from the exhaust gas and discharge the water to a drain (see Figure 1 and the corresponding text, claims 1-15, and paragraphs 4-5, and 28.) High and low temperature heat exchangers are taught with a water knockout that drains to a water feed line, which is included in the fuel supply unit. Thus, the claim is anticipated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pastula et al. (US 2002/0004154), as applied in the previous rejection, in view of Wattelet et al. (US 6,824,906.)

Pastula et al. (US 2002/0004154) teaches a fuel cell system, as previously noted. The reference does not teach the fuel cell to include a liquid organic compound having water solubility such as methanol. Wattelet et al. (US 6,824,906) teaches a fuel cell wherein the fuel may be methanol (col. 3, lines 1-48) and includes a water-mixing tank. The fuel cell comprises a heat exchanger and an exhaust condenser for the cathode exhaust. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the fuel system of Wattelet et al. (US 6,824,906) in the fuel cell of Pastula et al. (US 2002/0004154) in order to provide hydrogen for a fuel cell. Methanol is reformed to produce hydrogen. Wattelet et al. (US 6,824,906) teaches that methanol is a preferred fuel for vehicular applications because it is readily available. The methanol is not diluted until it is mixed with water in the fuel processing steps. Thus, one of ordinary skill in the art would use methanol as a fuel source for providing hydrogen in a fuel cell. The artisan would have found the claimed invention to be obvious in light of the teachings of the references.

Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pastula et al. (US 2002/0004154), as applied to claim 1 above, and further in view of Nanjo et al. (JP 2001-052,727.)

Pastula et al. (US 2002/0004154) teaches a fuel cell system, as previously noted. The reference does not teach the fuel cell to include an air supply unit that mixes cathode exhaust and source air. Nanjo et al. (JP 2001-052,727) teaches a fuel cell having improved efficiency by using the exhaust gasses to heat the fuel and oxidant source gasses before they enter the fuel cell membrane electrode assembly (see figures 1-4.) Further, the exhausts are recycled to the air and fuel sources and provided to the fuel cell (paragraphs 4 and 18-19.) The recycled reactants are mixed with the source reactants prior to preheating. As each reactant has its individual line and they are then mixed in a subsequent line, the lines form a tank for each reactant followed by the mixed reactants (see figures 1-4.) It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the fuel recycling system of Nanjo et al. (JP 2001-052,727) in the fuel cell of Pastula et al. (US 2002/0004154) in order to recycle unused reactant gas to the fuel cell in a mixture of reactants and improve the efficiency of the fuel cell system. The system provides increase efficiency by heating the inlet gasses using the exhaust gasses and provides recycled, unused, reactant gas to the fuel cell. The artesian would have found the claimed invention to be obvious in light of the teachings of the references.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's

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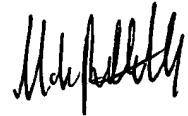
supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

Mark Ruthkosky

Primary Patent Examiner

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1.24.2007